

Observations on the Behaviour of *Antechinus minimus maritimus* (Marsupialia: Dasyuridae)

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Introduction

In Victoria, the Swamp Antechinus (*Antechinus minimus maritimus*), usually inhabits dense, wet, coastal tussock grassland or closed heathland, often close to a swamp or river area. It is frequently found in isolated patches along the coastline. Specimens have been recorded inland near Dartmoor, Heywood, Casterton, Wonthaggi and Gellibrand and on offshore islands in the Gippsland region - Glennie, Rabbit, Snake and Sunday Islands. Records indicate that there have been no observations east of Sunday Island in southern Gippsland (Atlas of Victorian Wildlife 1992). In a recent study in the Cape Otway National Park (Moro 1991), trapping success of the species was significantly positively correlated with vegetation cover 1 m in height and significantly negatively correlated with the presence of logs and tree canopy.

The species is terrestrial and is considered to be insectivorous, digging for food with well developed fore-claws (Wainer and Gibson, 1976). It exhibits

sexual dimorphism, with adult males reaching 100 g weight and females 60 g. Females come into oestrus once a year and all males appear to die soon after one mating, although a study of animals on Rabbit Island found males alive up to 16 months after birth (*pers. comm.*). The number of young raised varies with the number of teats of the female. The number of teats on mainland animals is 6 and 8 in Tasmania (Wainer 1983). Females may survive a second or some a third year. A gestation period of 30 ± 1 days for animals mated in the laboratory has been recorded (Wilson 1986). Breeding appears to be synchronous within the one locality each year, although variation does exist between geographically isolated populations. For example, births have occurred in a population near Port Campbell in July, in a population near Anglesea in August, (Wilson *et al.* 1986) and in a population in south Gippsland in September (Wainer 1983). The species is rare and restricted. There is a perceived need for more conservation parks in wet heathlands to decrease the risk to its survival.

Observations and captures of the Swamp Antechinus were made in the Anglesea region prior to the 1983 Ash Wednesday fire (Wilson *et al.* 1986; Victorian Atlas of Wildlife), but despite subsequent annual trapping of the area only four captures of this species were recorded in 1984 and one in 1986 (Wilson *et al.* 1990).

The objectives of this study were to locate and study the Swamp Antechinus in native habitat and to reintroduce some members of that population to part of the former range near Anglesea. An immediate goal of the reintroduction was for these animals to successfully breed at the new site. This article refers to initial work at the capture sites near Port Campbell.



Swamp antechinus *Antechinus minimus maritimus*.

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Methods

1. Trapping and Telemetry

In an attempt to monitor an established population, transect trapping of likely habitats was conducted near the mouth of Skenes Creek in the Otway ranges, near Gellibrand and near Blanket Bay in the Cape Otway National Park in June 1992. Minimal trapping success and limited vehicle access in most of these areas resulted in the ongoing trapping effort being based at Port Campbell, about 200 km. south-west of Melbourne. Preliminary trapping was carried out a few kilometres east of Port Campbell. In early July 1992, 60 Elliott traps baited with a mixture of rolled oats, peanut butter, and honey were set in a 6 x 10 grid pattern in closed heathland at the Port Campbell Rifle Range (38° 37' 20" S., 142° 58' 56" E). Traps were set about 10 m apart, and were checked each morning and late afternoon for 3 days. Two transect lines of 15 traps each were set at Two Mile Bay, immediately adjacent to the rifle range in the Port Campbell National Park. A similar trapping regime was undertaken in late-July 1992, December 1992, May 1993, December 1993.

Single stage radio transmitters and collars weighing about 1.5 g (Titley Electronics) were attached around the necks of a total of 5 adult Swamp Antechinus females and 1 adult and 1 juvenile male during these trapping periods. These animals were released at the point of capture and were tracked with hand held antennae and receivers. Positional fixes were taken a minimum 4 times a day for a period of up to 7 days per animal. During the trapping period, weight, sex, and identification recordings were made on all species of small mammals captured. Radio tracking data was analysed using the computer software package Ranges 4.

2. Vegetation

At each trap station, the plant species observed in a 1 m x 1 m area were recorded and structural features of the



Swamp antechinus showing position of radio collar.

vegetation including height and density measures were taken.

Results and Discussion

1. Trapping and Telemetry

Captures of Swamp Antechinus were made in June 1992 in the Port Campbell National Park near Loch Ard cemetery (1 capture of the species for 40 traps set for 1 night) and near Two Mile Bay (2 captures for 10 traps set over 1 night). Trapping in mid July at the Two Mile Bay site and on the nearby Rifle Range resulted in 10 captures of the species from 90 traps for 1 night. The 7 males ranged from 75-103 g in weight and the 3 females 45-52 g. All males and 2 females showed evidence of hair loss, ticks in the ears and orange coloured mites around the bare



Swamp antechinus showing size relative to hand.

skin in the anal and female pouch region. During the last week of July 1992, only 4 females were trapped over 90 trap nights at the Port Campbell Rifle Range. Three of these showed no major pouch development, the other was carrying 6 offspring, each approximately 6 mm long. Weights of the captured animals ranged from 47-54 g. The absence of males suggested that male die-off had occurred during mid to late July since they had appeared in such poor condition 2 weeks previously. The other species captured during trapping sessions were the Swamp Rat (*Rattus lutreolus*), which was located in densities of 40 per 100 trapnights, the Bush Rat (*Rattus fuscipes*), at 14 per 100 trapnights and the White Footed Dunnart (*Sminthopsis leucopus*) found in sparse vegetation covering a salt pan, 3 per 100 trapnights.

The first collared female was radio tracked and 14 fix positions were taken over a 24 hour period. The minimum convex area enclosed by all these readings was 0.53 ha. Soon after dusk the animal was traced to a burrow in the sandy podsollic soil about 100 m from the release site. The burrow entrance was about 4 cm in diameter. Later examination showed that the burrow was a 25 cm long sloping tunnel which reached an estimated depth of 10-15 cm. Another opening was located adjacent to the entrance. It led to a tunnel just above the soil surface but below the dense 5 cm deep litter layer. This litter tunnel was later used as an escape route when the animal had been released in the subterranean tunnel after subsequent recapture and collar removal. Dense shrubs of *Allocasuarina paludosa* 80-100 cm high obscured the burrow. Nearby two similar but not as extensive burrows were found. These ended after about 15 cm. The female was located in the burrow at half hourly intervals until 10 p.m. after which tracking ceased. The animal was present in the burrow at 7.30 a.m. the following day but had moved into dense *Melaleuca squarrosa* scrub by 11.30 a.m. It was later recaptured within 20 m of the burrow.

Another female with collar was traced to a burrow in a decayed *Xanthorrhoea minor* bole near a living *X. minor*, about 120 m from the release site for this animal. The whole area was covered by a 2-3 m high spreading *Eucalyptus ovata*. An extensive burrow system was located with at least two subterranean side tunnels exiting to the outside. The burrow entrance was also about 4 cm in diameter and the underground portion of the bole was used as a side wall in tunnel construction. The radio collar of this animal was retrieved from where it had been dropped in one of the side tunnels. The side tunnel was more than 20 cm long and was subterranean. However, over the top of most of the tunnel system a 10-20 cm mound of old leaf and stem material was present. It was assumed that this resulted from natural leaf accumulation over a number of years. Deep leaf litter nearby showed recent signs of digging by a small animal. When this litter was investigated, arthropods 0-2 cm long were uncovered. Later analysis of trap scats from 8 animals revealed arthropod remains, chiefly Orders Coleoptera and Blattaria representing insects, and Order Aranae the spiders.

Evidence of daylight movement by all Swamp Antechinus radio-tracked at irregular intervals was supported by trap captures during the day; traps cleared and then reset in the morning were found to have Swamp Antechinus captures that afternoon. This occurred on 9 occasions.

2. Vegetation

The vegetation where the animals were trapped at Two Mile Bay was about 1-1.5 m in height and the dominant plant species consisted of *Leucopogon parviflorus* and *Leptospermum continentale* as well as some *Galinia seiberiana*, *Banksia marginata* and *Xanthorrhoea minor*. Scattered stands of *Casuarina stricta* often reaching 4 m in height were present within 5m of trap settings. Frequent captures of different individual Swamp Antechinus took place near these trees. The more dense vegetation of the rifle

range was dominated by *A. paludosa*, *L. parviflorus*, *M. squarrosa* and *L. continentale*. This wind-pruned vegetation on and near the Port Campbell Rifle Range presents a closed canopy at a height of 1-1.2 m which results in zero wind velocity at ground level. In wetter areas where some open ground was observed, conspicuous species included *Juncus australis*, *Poa poiformis*, *Banksia marginata*, and *Gahnia* and *Lepidosperma* species.

Conclusions

The study found that *Antechinus minimus maritimus* utilise underground burrow systems, and are active during daylight hours. It appears that the males die-off in late July in this locality (Port Campbell). The mid-winter diet of the animals was mainly insectivorous, a finding consistent with other studies (Wainer, 1983). The species is sympatric with an omnivorous species (*Rattus fuscipes*), a

herbivore (*R. lutreolus*), and a small carnivore (*Sminthopsis leucopus*).

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- Cropper, S.C. (1993). 'Management of endangered plants'. (CSIRO: Melbourne.)
- Ehmann, H. (1992). 'Reptiles'. (Encyclopedia of Australian animals) (Angus and Robertson: Pymble.)
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- Kitching, R.L. (1993?). 'Ecology, biodiversity and the future of Australia'. (Griffith University: Nathan.)
- Lamp, C. Collet, F. (1989). 'Field guide to weeds in Australia', 3rd ed. (Inkata: Melbourne.)
- Strahan, R. (1992). 'Mammals'. (Encyclopedia of Australian animals). (Angus and Robertson: Pymble.)
- Tyler, M.J. (1992). 'Frogs'. (Encyclopedia of Australian animals). (Angus and Robertson: Pymble.)
- Walraven, E. (1990). 'Taronga Zoo's guide to the care of urban wildlife'. (Allen and Unwin: Sydney.)
- Wilson, J. ed. (1991). 'Victorian urban wildlife'. (Angus and Robertson: North Ryde.)
- Womersley, H.B.S. (1984). 'The marine benthic flora of Southern Australia', Part 1. (Government Printer: Adelaide.)
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